

IN THE CLAIMS:

Please **AMEND** claims 1, 3, 4, 9, 11-13, and 25-29 in accordance with the following:

1. (CURRENTLY AMENDED) An apparatus for forming a first state and a second state alternatively and sequentially on an optical recording medium in response to input data having a first level and a second level less than the first level, respectively, in an optical recording apparatus, the apparatus comprising:

a recording waveform generating unit generating a recording waveform which includes:

a first multi-pulse ~~having a plurality of first pulses corresponding to the first level of the input data~~ and alternating between a low first multi-pulse level and a high first multi-pulse level, and

a second multi-pulse preceding the first multi-pulse and having a plurality of second pulses corresponding to the second level of the input data, the second multi-pulse alternating between a low second multi-pulse level and a high second multi-pulse level, wherein

a leading one of the pulses of the second multi-pulses is set to a the low second multi-pulse level, and

a power level ~~of a pulse between an end of the second multi-pulse and a first one of the pulses of the first multi-pulses of the first multi-pulse is set to a the high second multi-pulse level, and~~

the high second multi-pulse level set between the low and high first multi-pulse levels.

2. (ORIGINAL) The apparatus of claim 1, further comprising:

a pickup unit generating light to form the first state and the second state on the optical recording medium in accordance with the first multi-pulse and the second multi-pulse of the recording waveform generated from the recording waveform generating unit.

3. (CURRENTLY AMENDED) The apparatus of claim 2, wherein the pickup unit comprises:

a laser device generating the light varying in accordance with the ~~first pulses of the first multi-pulse and the second pulses of the second multi-pulse~~ to form the first state and the second state on the optical recording medium.

4. (CURRENTLY AMENDED) The apparatus of claim 3, wherein the laser device has a voltage to generate the light, and the voltage varies according to the first ~~pulses~~ multi-pulse

during forming the first state and in accordance with the second ~~multi-pulse~~ pulses during forming the second state.

5. (ORIGINAL) The apparatus of claim 3, wherein the voltage is not a DC voltage.

6. (ORIGINAL) The apparatus of claim 1, wherein the input data comprises NRZI data having a high potential and a low potential each representing one of the first level and the second level.

7. (ORIGINAL) The apparatus of claim 1, wherein the first state is a mark, and the second state is a space.

8. (ORIGINAL) The apparatus of claim 1, wherein the first multi-pulse is a recording pattern to form a mark, and the second multi-pulse is an erase pattern to form a space.

9. (CURRENTLY AMENDED) The apparatus of claim 1, wherein the recording waveform generating unit generates a cooling pulse connecting another first multi-pulse preceding the second multi-pulse and which extended from a trailing one of the first-pulses of the another first multi-pulse to the leading one of the ~~second-pulses~~ of the second multi-pulse.

10. (ORIGINAL) The apparatus of claim 9, wherein the cooling pulse forms a portion of the first pulses and a portion of the second pulses.

11. (CURRENTLY AMENDED) The apparatus of claim 10, wherein the cooling pulse has a level less than the low first and second multi-pulse levels~~first pulses of the first multi-pulse have a first high level and a first low level, and the second pulses of the second multi-pulse have a second high level and a second low level.~~

12. (CURRENTLY AMENDED) The apparatus of claim 11, wherein the ~~second-high second multi-pulse level of the second-pulses is~~ less ~~smaller than the first-high first multi-pulse level of the first pulses.~~

13. (CURRENTLY AMENDED) ~~The apparatus of claim 11~~ An apparatus for forming a first state and a second state alternatively and sequentially on an optical recording medium in

response to input data having a first level and a second level less than the first level,
respectively, in an optical recording apparatus, the apparatus comprising:

a recording waveform generating unit generating a recording waveform which includes:

a first multi-pulse corresponding to the first level of the input data and alternating
between a low first multi-pulse level and a high first multi-pulse level,

a second multi-pulse following the first multi-pulse and corresponding to the
second level of the input data, the second multi-pulse alternating between a low second multi-
pulse level and a high second multi-pulse level,

the high second multi-pulse level is set between the low and high first multi-pulse
levels, and

~~wherein the first pulses comprise a first starting pulse and a first ending pulse,~~
~~and the second pulses comprise a second starting pulse and a second ending pulse, the a~~
~~power level between an end of the second multi-pulse and a first one of the pulses of the first~~
~~multi-pulse first starting pulse varying is varied in accordance with the a power level of a last one~~
~~of the pulses of the second multi-pulse and a pulse duration of the power level between the end~~
~~of the second multi-pulse and the first one of the pulses of the first multi-pulse starting pulse and~~
~~the second ending pulse of the second pulses.~~

14. (ORIGINAL) The apparatus of claim 11, wherein the first pulses have a first duty cycle, and the second pulses a second duty cycle.

15. (ORIGINAL) The apparatus of claim 14, wherein each second pulse comprises a high level and a low level, and the second duty cycle comprises:

a ratio of a duration time of the high level and another duration time of the low level in a range between $0.25T$ and $0.75T$, where T is a cycle of a reference clock.

16. (ORIGINAL) The apparatus of claim 1, further comprising:

a servo unit rotating the optical recording medium according to one of the first multi-pulse and the second multi-pulse during forming the first state and the second state.

17. (ORIGINAL) The apparatus of claim 16, wherein the second multi-pulse comprises a starting pulse and an ending pulse, and the servo unit controls a rotation speed of the optical recording medium in accordance with one of a starting pulse and an ending pulse of the second multi-pulse.

18. (PREVIOUSLY PRESENTED) The apparatus of claim 1, wherein the recording waveform generating unit detects information data representing a characteristic of the second multi-pulse.

19. (PREVIOUSLY PRESENTED) The apparatus of claim 18, wherein the optical recording medium includes a wobble signal, and the recording waveform generating unit detects the information data from the wobble signal.

20. (ORIGINAL) The apparatus of claim 18, further comprising:
a servo unit rotating the optical recording medium in accordance with the information data.

21. (ORIGINAL) The apparatus of claim 18, further comprising:
a laser device recording the information data on the optical recording medium.

22. (ORIGINAL) The apparatus of claim 21, wherein the optical recording medium comprises a lead-in-area, and the information data is recorded in the lead-in-area of the optical recording medium.

23. (PREVIOUSLY PRESENTED) The apparatus of claim 21, further comprising:
a servo unit receiving the information data read from the optical recording medium and rotating the optical recording medium at a speed corresponding to the received information data.

24. (PREVIOUSLY PRESENTED) The apparatus of claim 21, further comprising:
a servo unit rotating the optical recording medium in a first speed, receiving the information data from the optical recording medium, and rotating the optical recording medium at a second speed according to the received information data.

25. (CURRENTLY AMENDED) An apparatus for forming a first state and a second state alternatively and sequentially on an information storage medium in response to input data having a first level and a second level, respectively, in a recording apparatus, the apparatus comprising:
a recording waveform generating unit generating a recording waveform which comprises:
a first multi-pulse ~~having a plurality of first pulses~~ corresponding to the first level

of the input data and which has a plurality of first pulses alternating between a low first multi-pulse power level and a high first multi-pulse power level,

a second multi-pulse which precedes the first multi-pulse and having a plurality of second pulses corresponding to the second level of the input data, the second multi-pulse having a plurality of second pulses alternating between a low second multi-pulse power level and a high second multi-pulse power level, and

the high second multi-pulse power level is set as less than the high first multi-pulse power level,

a cooling pulse concatenating the first and second multi-pulse and another first multi-pulse preceding the second multi-pulses and having a power level less than the first and second low multi-pulse power levels, and

wherein a leading one of the second pulses is set to a the low second multi-pulse level and a power of a pulse level between an end of the second multi-pulse and a first one of the first pulses of the first multi-pulse is set to a the high second multi-pulse level.

26. (CURRENTLY AMENDED) An apparatus for forming a first state and a second state alternatively and sequentially on an information storage medium in response to input data having a first level and a second level, respectively, in a recording apparatus, the apparatus comprising:

a recording waveform generating unit generating a recording waveform which comprises:

a first multi-pulse having a plurality of first pulses corresponding to the first level of the input data and having a plurality of first pulses alternating between a low first multi-pulse power level and a high first multi-pulse power level,

a second multi-pulse having a plurality of second pulses corresponding to the second level of the input data and preceding the first multi-pulse, the second multi-pulse having a plurality of second pulses alternating between a low second multi-pulse power level and a high second multi-pulse power level, and

the high first multi-pulse level is set as greater than the second high multi-pulse level,

a cooling pulse concatenating the first and second multi-pulse and another first multi-pulses preceding the second multi-pulse and having a power level less than the first and second low multi-pulse power levels, and

wherein a leading one of the second pulses is set to a the high second multi-pulse level and a power level of a pulse between an end of the second multi-pulse and a first one of the first pulses of the first multi-pulse is set to the high second multi-pulse level.

27. (CURRENTLY AMENDED) An apparatus for forming a first state and a second state alternatively and sequentially on an information storage medium in response to input data having a first level and a second level, respectively, in a recording apparatus, the apparatus comprising:

a recording waveform generating unit generating a recording waveform which comprises:

a first multi-pulse ~~having a plurality of first pulses~~ corresponding to the first level of the input data and having a plurality of first pulses alternating between a low first multi-pulse power level and a high first multi-pulse power level,

a second multi-pulse ~~having a plurality of second pulses preceding the first multi-pulse and~~ corresponding to the second level of the input data, the second multi-pulse having a plurality of second pulses alternating between a low second multi-pulse power level and a high second multi-pulse power level,

~~and a cooling pulse concatenating the first and second multi-pulses and another first multi-pulse preceding the second multi-pulse and having a power level less than the first and second low multi-pulse power levels,~~ and

~~wherein a leading one of the second pulses is set to the a-low second multi-pulse power level and a power level of a pulse between an end of the second multi-pulse and a first one of the first pulses of the first multi-pulse is set to the low second multi-pulse power level.~~

28. (CURRENTLY AMENDED) An apparatus for forming a first state and a second state alternatively and sequentially on an optical recording medium in response to input data having a first level and a second level, respectively, in an optical recording apparatus, the apparatus comprising:

a recording waveform generating unit generating a recording waveform which includes:

a first multi-pulse ~~having a plurality of first pulses~~ corresponding to the first level of the input data and having a plurality of first pulses alternating between a low first multi-pulse power level and a high first multi-pulse power level,

a second multi-pulse preceding the first multi-pulse and ~~having a plurality of second pulses~~ corresponding to the second level of the input data, the second multi-pulse having a plurality of second pulses alternating between a low second multi-pulse power level and a high second multi-pulse power level,

the high first multi-pulse power level is set as greater than the high second multi-pulse power level, and

~~wherein a leading one of the second pulses is set to a-the high second multi-~~

pulse power level and a power level of a pulse between an end of the second multi-pulse and a first one of the first pulses of the first multi-pulse is set to the high second multi-pulse power level.

29. (CURRENTLY AMENDED) An apparatus for forming a first state and a second state alternatively and sequentially on an optical recording medium in response to input data having a first level and a second level, respectively, in an optical recording apparatus, the apparatus comprising:

a recording waveform generating unit generating a recording waveform which includes:

a first multi-pulse ~~having a plurality of first pulses corresponding to the first level of the input data and~~ having a plurality of first pulses alternating between a low first multi-pulse power level and a high first multi-pulse power level,

a second multi-pulse preceding the first multi-pulse and ~~having a plurality of second pulses corresponding to the second level of the input data,~~ the second multi-pulse having a plurality of second pulses alternating between a low second multi-pulse power level and a high second multi-pulse power level,

the high first multi-pulse power level is set as greater than the high second multi-pulse power level, and

~~wherein a leading one of the second pulses is set to a low~~ second multi-pulse power level and a power level of a pulse between an end of the second multi-pulse and a first one of the first pulses of the first multi-pulse is set to the low second multi-pulse power level.